TEEL PLASTICS STORY

Teel Plastics, Inc. utilizes four facilities employing processes of extrusion, pultrusion, compounding, and an analytical laboratory to specialize in the custom manufacture of close tolerance plastic tubing and profile products. They have expanded their capabilities, improved their value added services, and continue to offer customers a wide range of plastic tubing and profiles in a variety of sizes and materials.

With over 50 years of experience, Teel has the expertise to anticipate trends and stay on the cutting edge of technology. Teel was one of the first manufacturers to extrude multilayer plastic tubing with their co-extrusion process. Multilayered plastic tubing offers physical performance enhancements not found in mono-layered plastic tubing.

Along the way, Teel has originated engineering improvements and broken new ground in product development. Teel was the first to extrude paper-plastic composite materials and pioneered the prototype of multi-layer fuel line tubing. They invented numerous in-line precision cutting techniques and were the first extruder to provide plastic tubing for cattle insemination.

Teel’s objective is to be the preferred employer in the Baraboo area and experienced no layoffs during the recent economic downturn in 2009. Much of this is due to employees’ willingness to be cross-trained. Over 50 percent of their employees are trained to work in more than one of their plants depending on the demand for the products produced in that plant.

Location: Baraboo, Wisconsin
Industry: Plastic tubing and plastic profiles
Size: 275 employees in four plants in Baraboo, Wisconsin
Contact: Jay Smith, Chairman
Joel Soenksen, Director of Continuous Improvement

NEW HEADQUARTERS AND EXTRUSION FACILITY

Teel moved into their new 150,000 square feet manufacturing facility and corporate headquarters in 2007. The building is the first resident in the new Gateway Business Park in Baraboo, and the site was designed with sustainability in mind. The much needed space accommodates their expanding extrusion division. The environmentally conscious facility supports the principles of lean manufacturing. The manufacturing area will reach new standards in terms of maximizing efficiency and their ability to service customer requirements. The new facility brings

“The primary objectives of Teel’s sustainability activities are to reduce the business impact on the environment and to create a healthy work environment.”
Jay Smith
Chairman, Teel Plastics
together two cultures; healthcare and industrial products, providing the opportunity to combine value streams. The facility is built around a hub and spokes concept. This puts operations and administration managers in direct contact with plant personnel at all times.

The company set specific goals for energy savings, electrical usage, natural gas consumption and carbon dioxide emissions, which were built into the objectives for their new facility.

**LIGHTING**

Office lighting features T5, fluorescent, two lamp fixtures which reduce energy costs 34 percent compared to standard T8, three tube fixtures. 85 percent of the office area incorporates occupancy sensors, and natural day lighting reduces heat load and minimizes the need for artificial lighting.

The manufacturing area is illuminated by T5HO fluorescent fixtures that reduce electrical consumption 27 percent compared to standard 400 watt metal halide fixtures. The plant incorporates day lighting and white ceilings for increased efficiency.

Compared to the benchmark of the Wisconsin State Energy Code:

- Interior lighting uses 46 percent less energy than allowed
- Exterior lighting uses 65 percent less energy than allowed

**HEATING AND COOLING**

Office area heating and cooling features cooling units equipped with Variable Frequency Drives to adjust to varying loads, reducing energy consumption up to 50 percent. Heat recovery units capture exhaust air. Building automation software controls all zones of heating and cooling to optimize high efficiency. High efficiency boilers are 88 percent efficient vs. standard boilers at 80 percent.

The manufacturing area is equipped with highly efficient heating units. Rejected heat from production line equipment, such as extruders, is re-circulated to offset the heating load. In the summer, the plant is air conditioned, which enhances the production process.

**WINDOWS**

Titanium coating on exterior glass reduces heat transmission and loss 20 percent compared to standard low E glass, saving on heat and air conditioning costs.

**GROUNDS**

Site development around the new plant, featuring on-site retention ponds, was designed to minimize runoff and lower the volume of waste water the city of Baraboo has to deal with. In addition, production wastes and recycling are contained in the building preventing contamination of storm water runoff. Working with the International Crane Foundation, native grasses, sedges, and forbs fill the swales, infiltration areas, and the perimeter of detention ponds providing a natural habitat for wildlife, filtration for run-off, and helping infiltrate water into the ground more quickly. These plantings also minimize watering and mowing thus reducing maintenance costs and gas usage.

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**What does SUSTAINABILITY mean to businesses?**

The most commonly used definition of Sustainability incorporates the precept of “meeting the needs of the present without compromising the ability of future generations to meet their own needs.” Now this is a pretty far reaching statement and is not particularly helpful to businesses driven by production goals, quality improvement, increased efficiency and cost cutting. As we talk to those business leaders already engaged in sustainability efforts, the terms they tell us include:

1. consider the entire life cycle of the product and of physical assets;
2. consider the effect on the community infrastructure;
3. environmental solutions must have a business purpose and bring value to the business;
4. you must have passion for it and enable staff to be innovative.

We’ve found that sustainability is a very broad subject incorporating product design, procurement, production, packaging, logistics, facilities design and operation, safety, health, leadership, employee involvement and community support. We’ve also learned that while companies exhibiting best practices may not hit every one of those marks, they get pretty close. So choose a definition that best suits your business, but know that the companies we’ve talked with are successful partly because of their passion for sustainability, not in spite of it.
**PRODUCT DESIGN**

Teel Plastics is a pioneer in the production of environmentally conscious natural fiber composites and thermoplastics. Wood flower, rice hulls, coconut hulls, and other natural fibers are some of the materials that have been used in fiber composites. Teel's compounding creates unique physical properties in a wide variety of products.

**PROCESS SYSTEMS**

Teel considers sustainability a key component of their corporate-wide objectives to support growth. They recognize people as a critical element to the process. Implementing a lean enterprise culture and cross-functional teams focuses on continuous improvement efforts eliminating waste. These processes help identify potential opportunities for energy savings, improved first pass yield, and other sustainability related process improvements.

Practicing Lean principles improves the value stream throughout the company in all areas from sales opportunity to order fulfillment. Set-up reduction has provided additional capacity on existing equipment to allow capital to be directed into opportunities to diversify. Kanban systems are applied to manufacturing supplies and to vendor managed inventories with customers to maximize inventory turns.

Teel aggressively implements methods for scrap reduction. Previously, 75 percent of the scrap was generated during the line change over. They have implemented improved practices for change over eliminating most of the product scrap generated in the first pass. The company goal is zero landfilling and currently less than one percent of materials used in production goes to landfill. Where waste is generated, they use plastic recyclers to eliminate disposal.

The Quality System has been certified to ISO9001 standards since 1997. This system is an integral part of the business organization providing the foundation for growth and achievement of the company's vision. The system provides a method to have predictable results in production, new hire training, and sustain documentation of best practices. Process control is also achieved with computerized SPC (Statistical Process Control) on all production lines.
Environmentally conscious manufacturing is a new way of thinking about manufacturing. It focuses on the most efficient and productive use of raw materials and natural resources, while minimizing the adverse impact on employees and the environment.

Oil-free, frictionless magnetic bearings, variable speed Turbocor Chillers are used to cool production line processes, reducing energy usage 40 percent compared to a conventional screw type chiller. In the old plant, manufacturing processes used approximately 500,000 gallons of water per day. The closed loop chilled system was installed in the new plant reducing usage to 50,000-75,000 gallons per day. The re-engineered process cooling system reduces wastewater by greater than 80 percent. A variable speed drive compressed air system saves up to 25 percent of the energy used by standard compressors.

For more information on WMC’s Sustainability efforts, contact Mike Shoys, mshoys@wmc.org, (608) 258-3400.

REFERENCES

Green Tier
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